

Claims

- [c1] 1. In a database system, a method for providing a stored procedure as a Web service, the method comprising:
predefining a stored procedure to be invoked upon receiving a client request for a particular Web service;
receiving an incoming request from a particular client for the particular Web service;
in response to the incoming request, identifying the stored procedure that is predefined for the particular Web service;
executing the identified stored procedure for generating a result set; and
returning the result set back to the particular client.
- [c2] 2. The method of claim 1, wherein the incoming request is received by an HTTP server that is built into the database system.
- [c3] 3. The method of claim 2, further comprising:
upon receiving the incoming request, verifying that the request comprises a valid HTTP request for a Web service.
- [c4] 4. The method of claim 1, wherein client requests em-

ploy HTTP protocol.

- [c5] 5. The method of claim 4, wherein client requests further specify a selected one of XML, SOAP, WSDL, and raw format.
- [c6] 6. The method of claim 1, wherein said returning step further comprises:
formatting the result set into a particular presentation format; and thereafter
returning the formatted result set back to the particular client.
- [c7] 7. The method of claim 1, wherein said executing step further comprises:
creating a temporary pseudo connection to a database engine of the database system; and
executing the stored procedure through said temporary pseudo connection.
- [c8] 8. The method of claim 1, wherein the incoming request comprises a URL.
- [c9] 9. The method of claim 8, wherein the URL includes parameter information affecting how the identified stored procedure is executed.
- [c10] 10. The method of claim 1, wherein the identified stored

procedure may include any valid SQL statement.

- [c11] 11. The method of claim 1, wherein the identified stored procedure itself may invoke other stored procedures.
- [c12] 12. The method of claim 1, wherein execution of the identified stored procedure occurs asynchronously with respect to the incoming request.
- [c13] 13. The method of claim 1, wherein the identified stored procedure selects data from a database, and wherein the result set returned to the particular client comprises that data formatted in a manner suitable for return via HTTP protocol.
- [c14] 14. The method of claim 13, wherein the data is formatted for return as XML-formatted data.
- [c15] 15. The method of claim 14, wherein the result set comprises a plurality of database rows, and wherein the XML-formatted data comprises said plurality of database rows delimited with XML row tags.
- [c16] 16. The method of claim 1, wherein the identified stored procedure itself may set HTTP header information that is returned to the particular client.
- [c17] 17. The method of claim 1, wherein the incoming request is received via a selected one of HTTP, FTP, and

telnet protocol.

- [c18] 18. The method of claim 1, wherein the system first checks user authentication for the particular client before executing the identified stored procedure.
- [c19] 19. A computer-readable medium having processor-executable instructions for performing the method of claim 1.
- [c20] 20. A downloadable set of processor-executable instructions for performing the method of claim 1.
- [c21] 21. A database system providing stored procedures as Web services, the system comprising:
 - a database engine controlling a database that includes a stored procedure to be invoked upon receiving a request for a particular Web service;
 - a communications layer for receiving an incoming request from a particular client for the particular Web service;
 - an HTTP server for parsing and validating the incoming request;
 - a request layer for identifying and executing the stored procedure for the particular Web service, for generating a result set; and
 - a presentation layer for returning the result set back to

the particular client.

[c22] 22. The system of claim 21, wherein the HTTP server resides in an executable space that is shared with the database system.

[c23] 23. The system of claim 22, wherein the HTTP server verifies that the incoming request comprises a valid HTTP request for a Web service.

[c24] 24. The system of claim 21, wherein client requests employ HTTP protocol to communicate with the database system.

[c25] 25. The system of claim 24, wherein client requests further specify a selected one of XML, SOAP, WSDL, and raw format.

[c26] 26. The system of claim 21, wherein the presentation layer formats the result set into a particular presentation format before returning the result set to the particular client.

[c27] 27. The system of claim 21, wherein the request layer includes program logic for creating a temporary pseudo connection to the database engine of the database system, and for executing the stored procedure through the temporary pseudo connection.

- [c28] 28. The system of claim 21, wherein the incoming request comprises a URL.
- [c29] 29. The system of claim 28, wherein the URL includes parameter information affecting how the identified stored procedure is executed.
- [c30] 30. The system of claim 21, wherein the identified stored procedure may include any valid SQL statement.
- [c31] 31. The system of claim 21, wherein the identified stored procedure itself may invoke other stored procedures.
- [c32] 32. The system of claim 21, wherein execution of the identified stored procedure occurs asynchronously with respect to the incoming request.
- [c33] 33. The system of claim 21, wherein the identified stored procedure selects data from the database, and wherein the result set returned to the particular client comprises that data formatted in a manner suitable for return via HTTP protocol.
- [c34] 34. The system of claim 33, wherein the data is formatted for return as XML-formatted data.
- [c35] 35. The system of claim 34, wherein the result set comprises a plurality of database rows selected from the

database, and wherein the XML-formatted data comprises said plurality of database rows delimited with XML row tags.

- [c36] 36. The system of claim 21, wherein the identified stored procedure itself may set HTTP header information that is returned to the particular client.
- [c37] 37. The system of claim 21, wherein the incoming request is received via a selected one of HTTP, FTP, and telnet protocol.
- [c38] 38. The system of claim 21, wherein the system first checks user authentication for the particular client before executing the identified stored procedure.
- [c39] 39. The system of claim 21, wherein the request layer includes program logic for translating the request into a form that can be processed by the database engine.
- [c40] 40. The system of claim 21, wherein the incoming request is received over an HTTP connection, and the result set is returned to the particular client over an HTTP connection.